



Early Child Development

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Martin Guhn, PhD

Assistant Professor

School of Population and Public Health

University of British Columbia

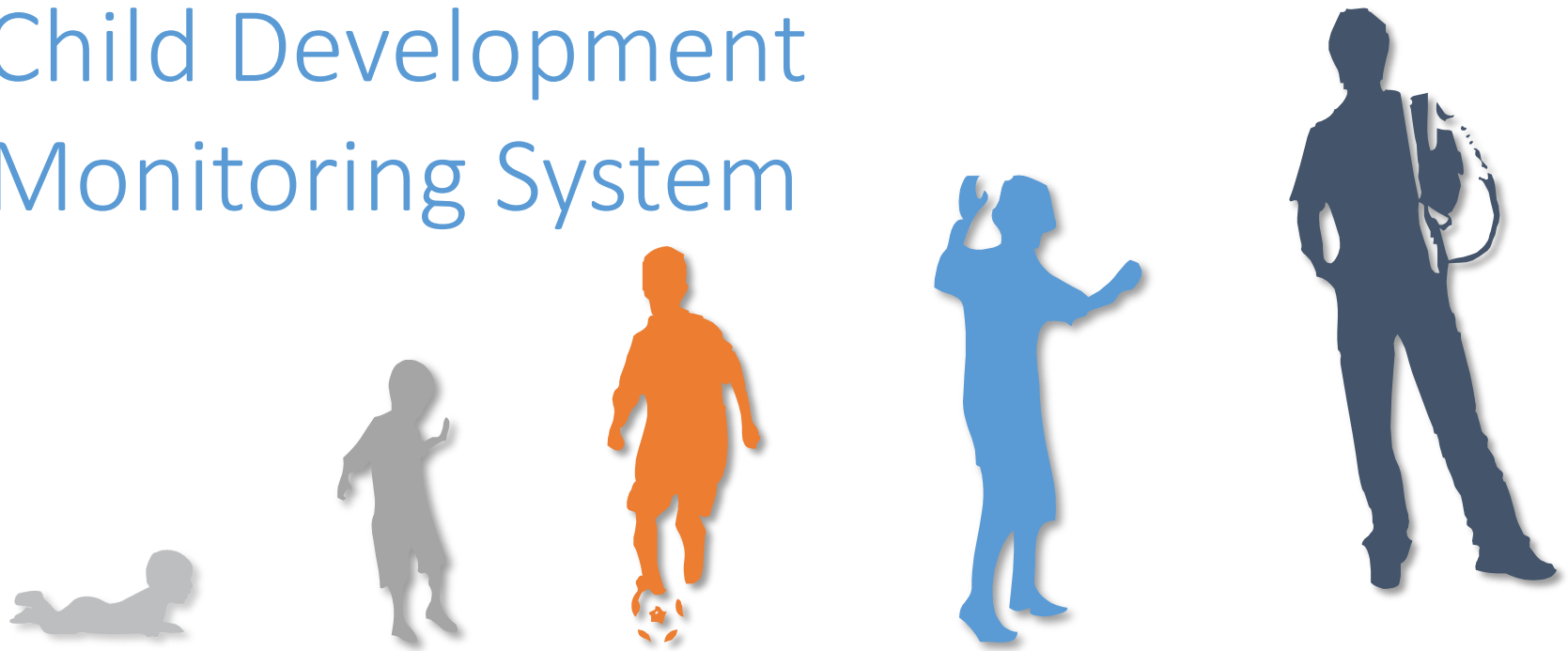
HUMAN
EARLY LEARNING
PARTNERSHIP



Early childhood experiences, lifelong health, and the role of poverty

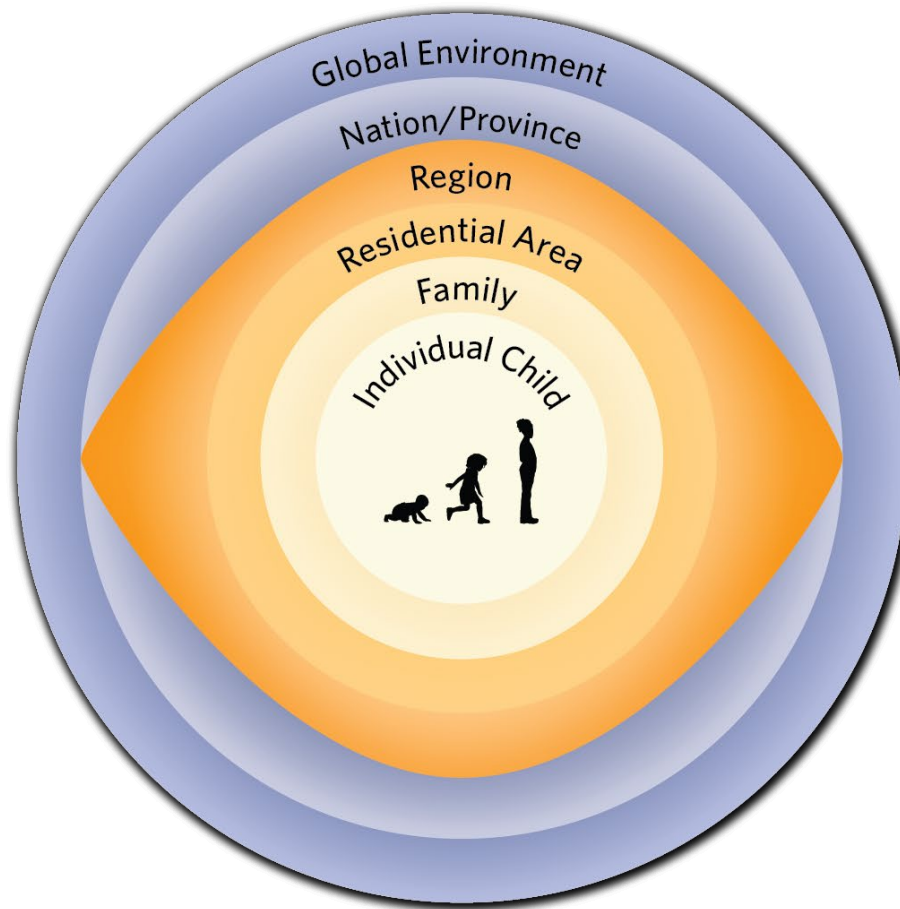


Building a Population-Based Comprehensive Child Development Monitoring System

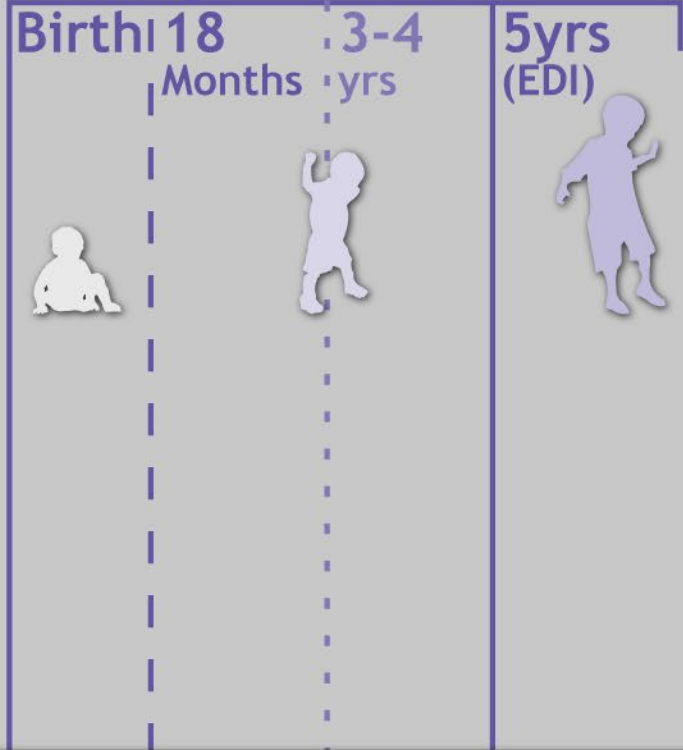


... for informed decision-making.

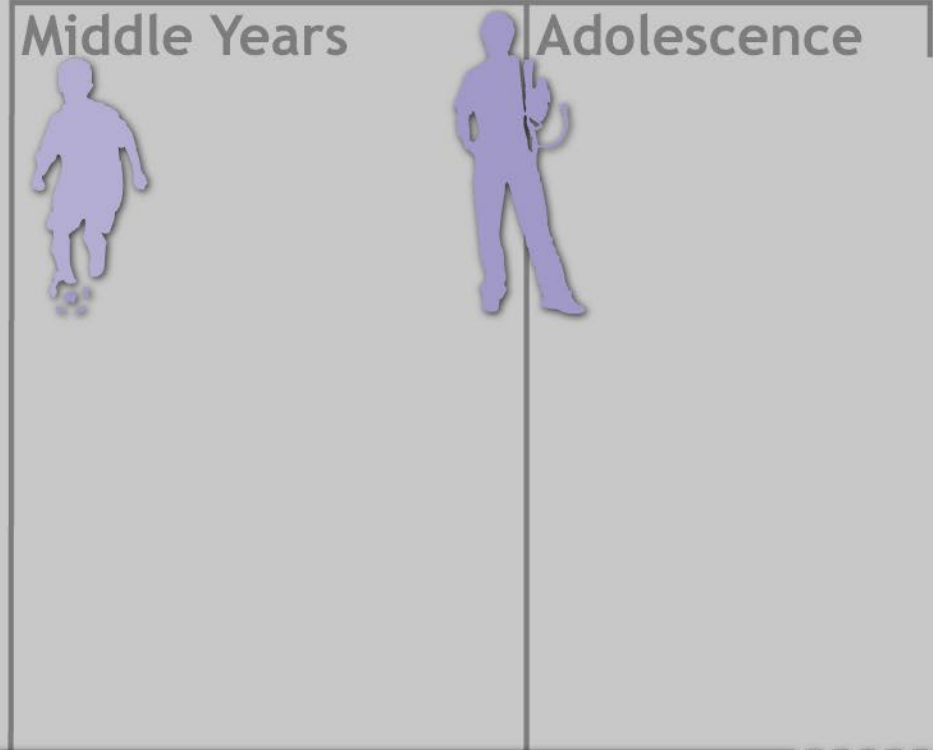
A bioecological model of child development



Early Years



Later Life Course



0 5 10 18 YEARS

Early Years

Later Life Course

Birth | 18 Months | 3-4 yrs | 5yrs (EDI)

Middle Years | Adolescence



Population Measures

0 5 10 18 YEARS

Early Years

Later Life Course

Birth | 18 Months | 3-4 yrs | 5yrs (EDI)

Middle Years | Adolescence



Population Measures



0 5 10 18 YEARS



The Early Development Instrument



Early Development Instrument (Janus & Offord, 2007)



EARLY DEVELOPMENT INSTRUMENT
a population-based measure for communities

A teacher-administered tool



What Does the EDI Measure?

Social
Competence

Emotional
Maturity

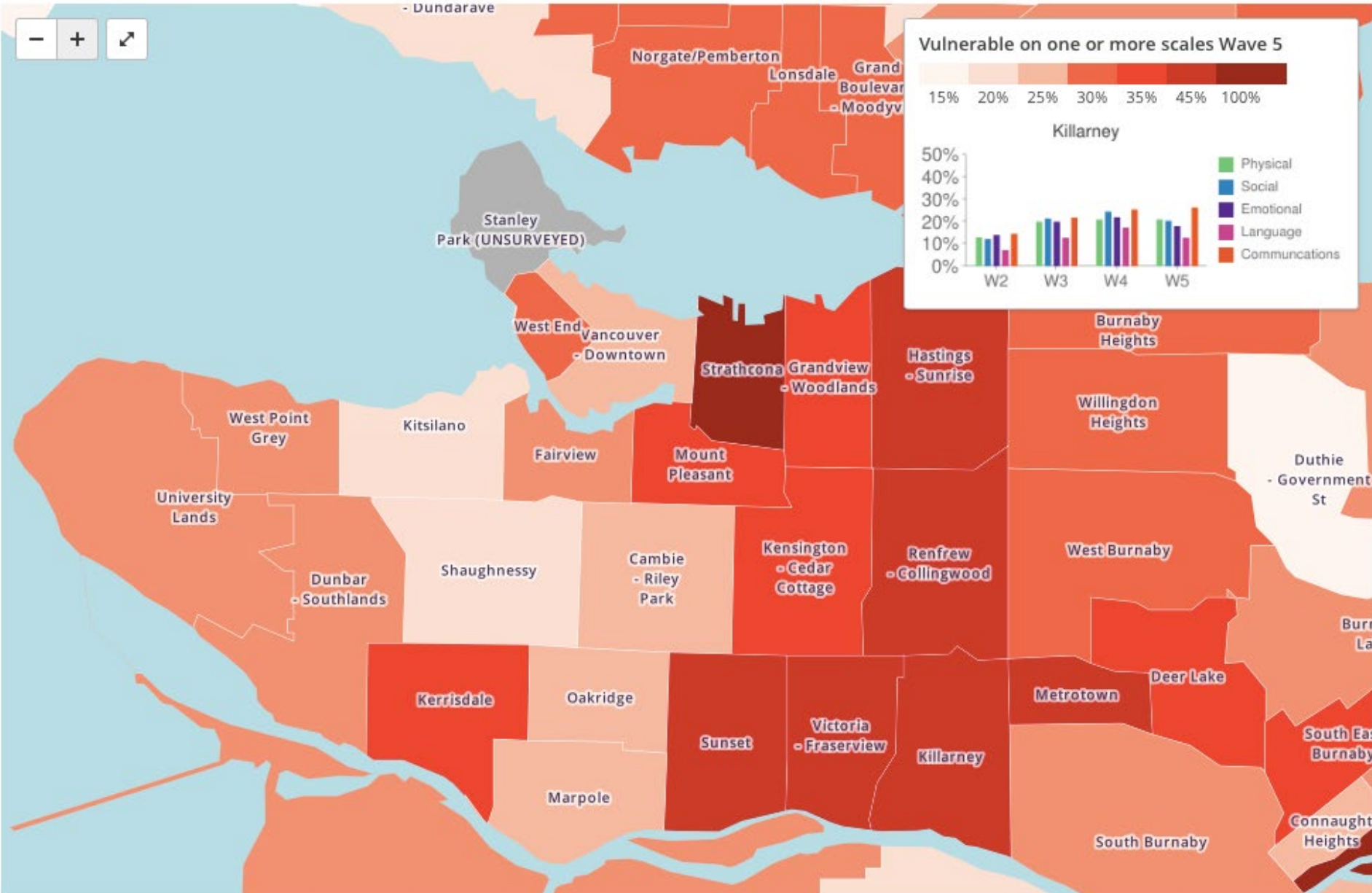
Language
& Cognitive

Communication Skills

Physical Health
& Well-Being



SD39-Vancouver



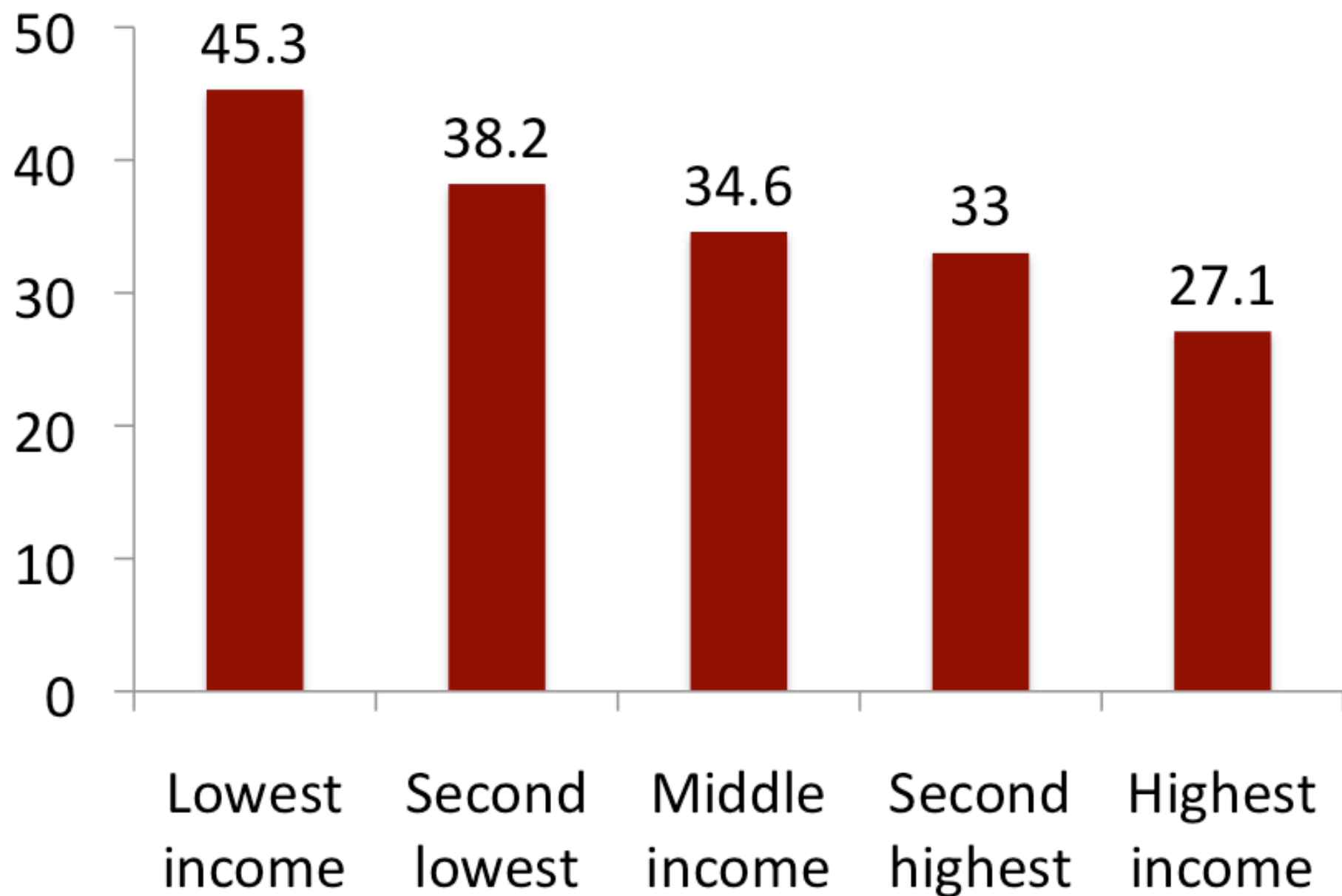
*Explaining
variability in
child outcomes*





Association with
poverty

EDI vulnerability rate





The socioeconomic gradient in health

Inequalities in socioeconomic status

are related to

inequalities in population health.



Deep and persistent wealth inequality in Canada

Broadbent Institute, 2014

DISTRIBUTION OF WEALTH IN CANADA BY DECILE, 2012

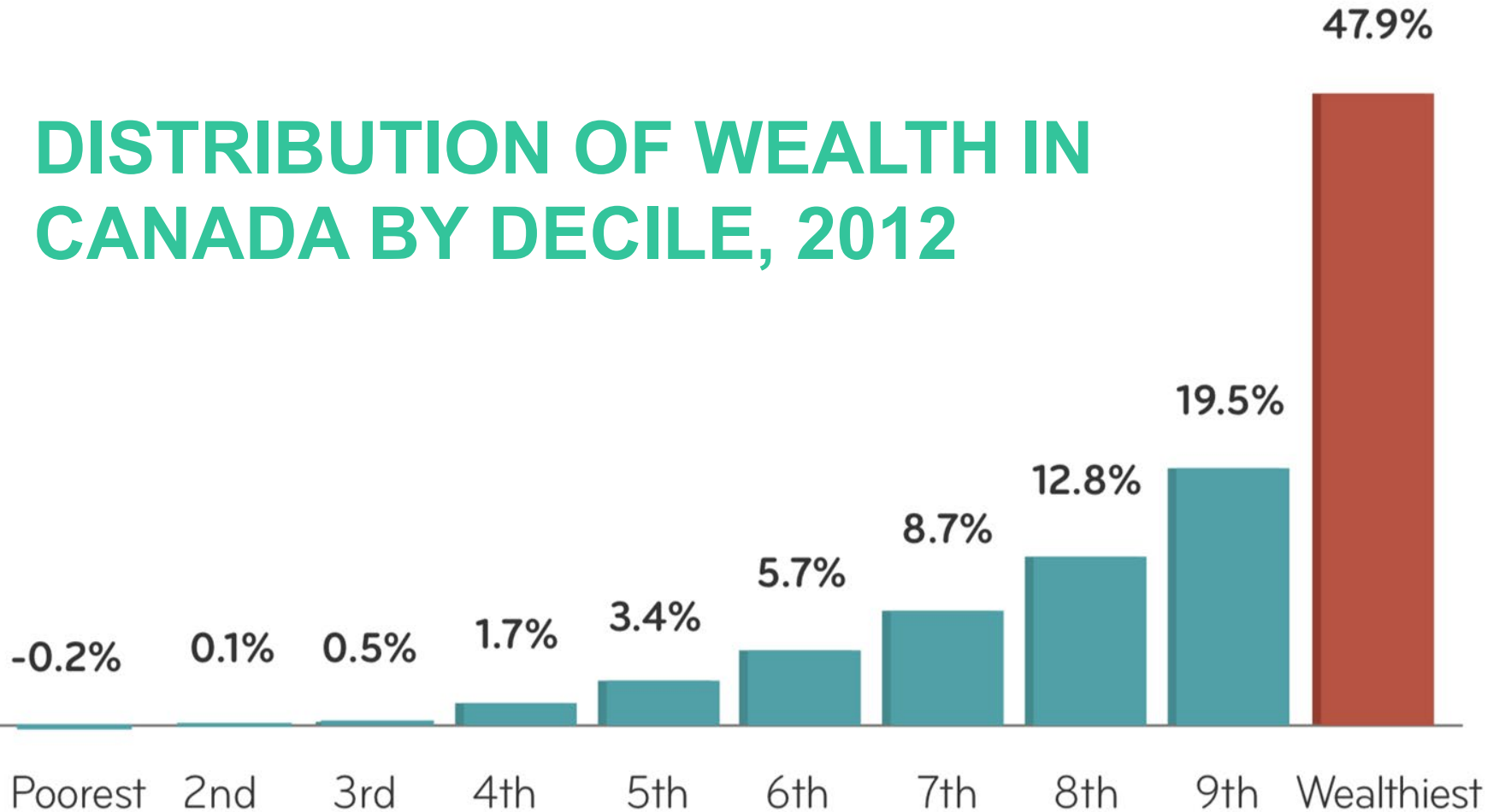
Poorest 2nd 3rd 4th 5th 6th 7th 8th 9th Wealthiest



Deep and persistent wealth inequality in Canada

Broadbent Institute, 2014

DISTRIBUTION OF WEALTH IN CANADA BY DECILE, 2012



BC Child Poverty report card

<https://still1in5.ca>

2017 ANNUAL REPORT CARD

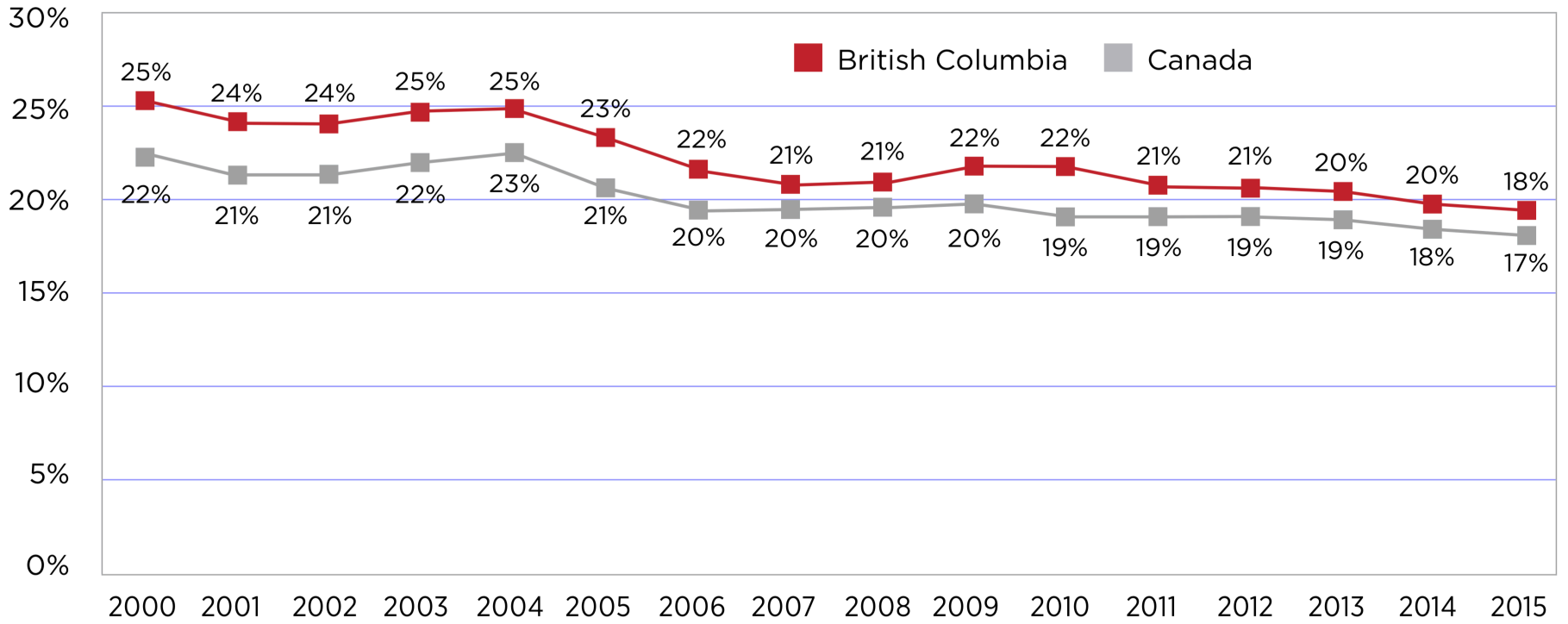


1 out of 5
BC CHILDREN ARE POOR





Child Poverty Rates for Canada and British Columbia, LIM After Tax, 2000-2015



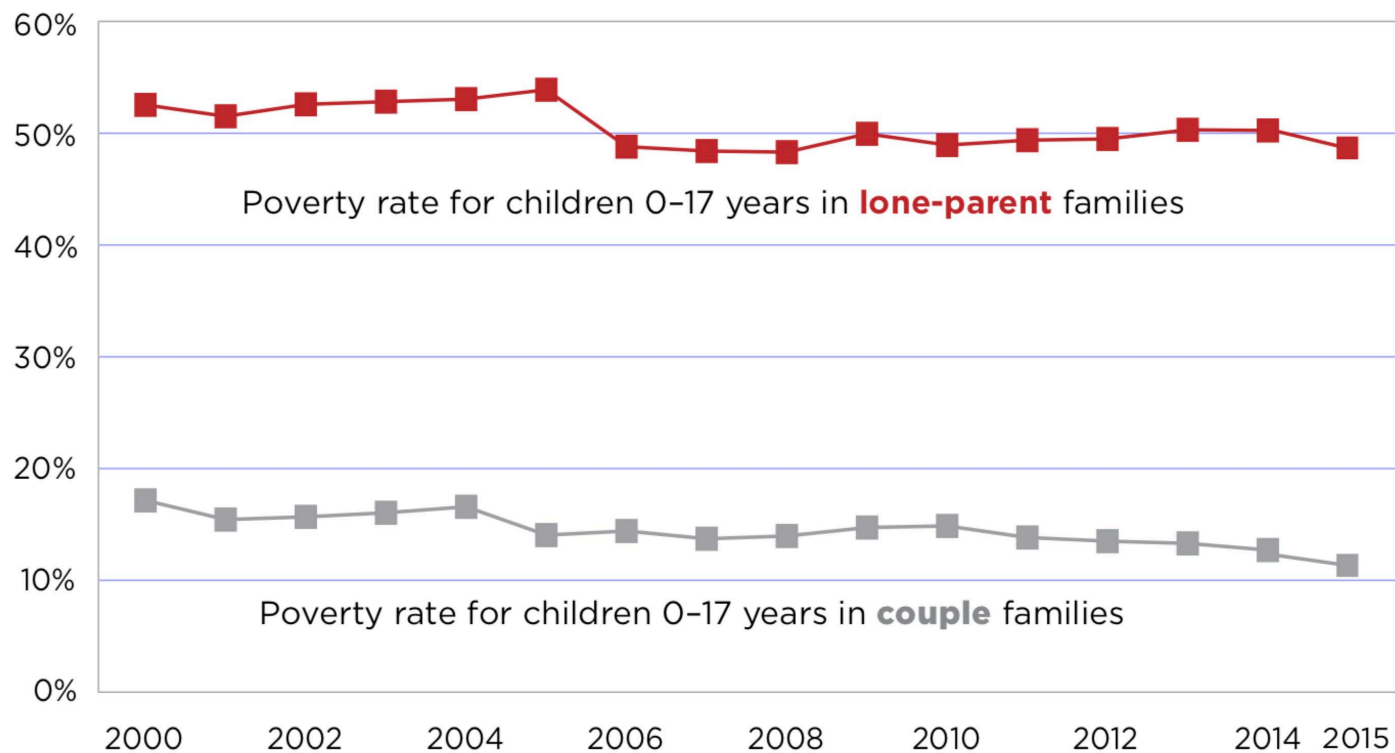
Source: Statistics Canada. CANSIM Table 111-0015.

*That is the
overall rate –
but are all groups
equally
affected?*





BC Child Poverty Rate by Family Type, LIM After-Tax, British Columbia, 2000-2015



One in every two BC children of single parents were poor in 2015.

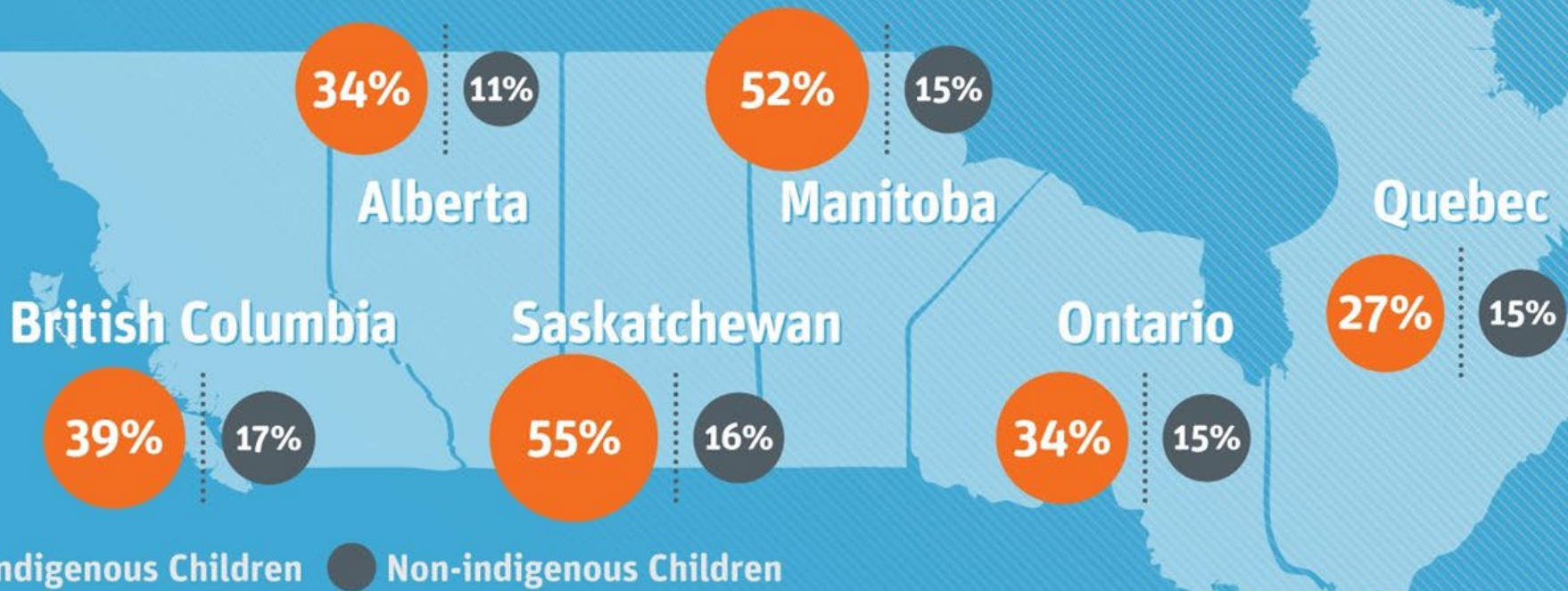


Source: Statistics Canada. CANSIM Table 111-0015.



From Bad to Worse

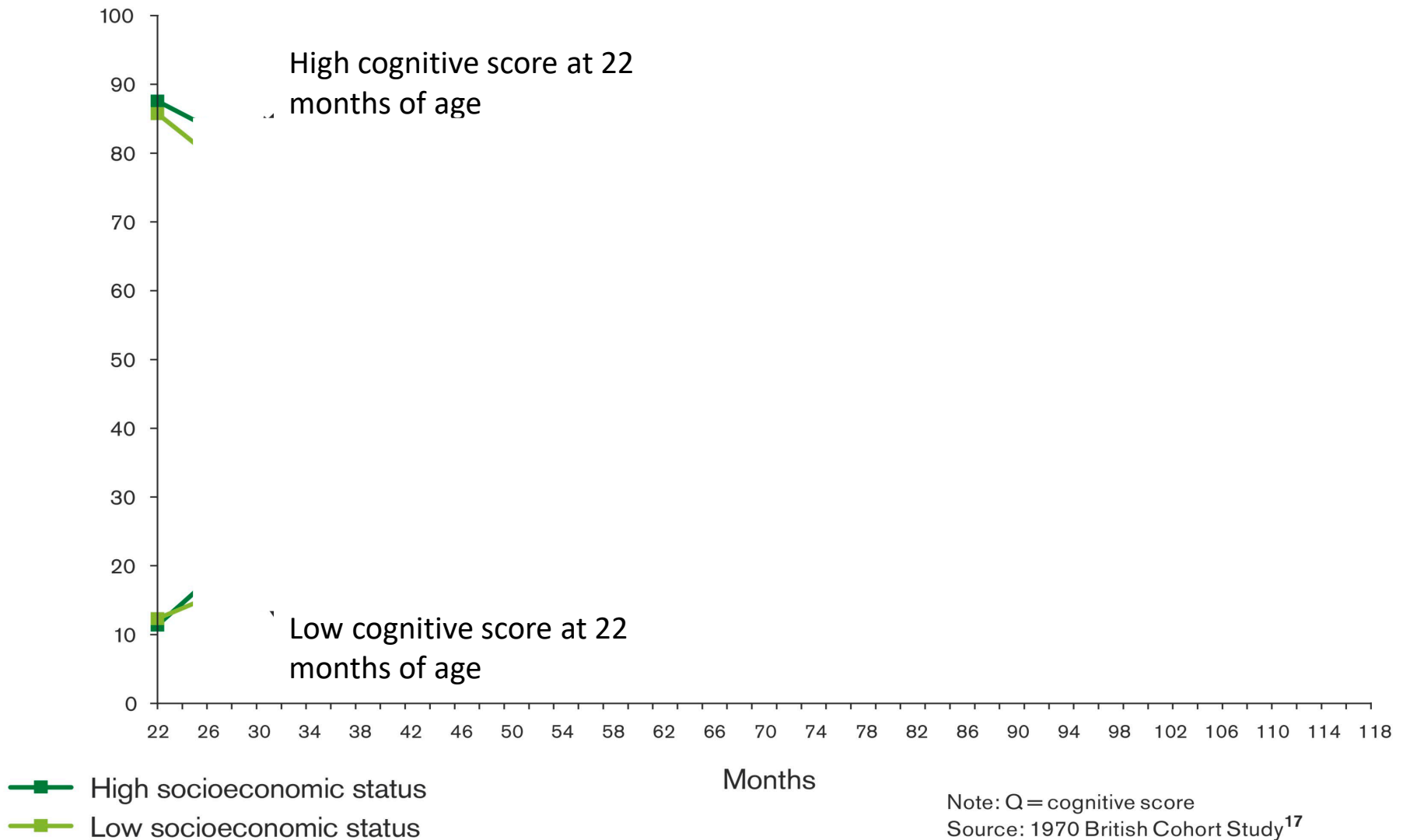
CHILD POVERTY RATES IN CANADA



Learn more at policyalternatives.ca/poverty-or-prosperity

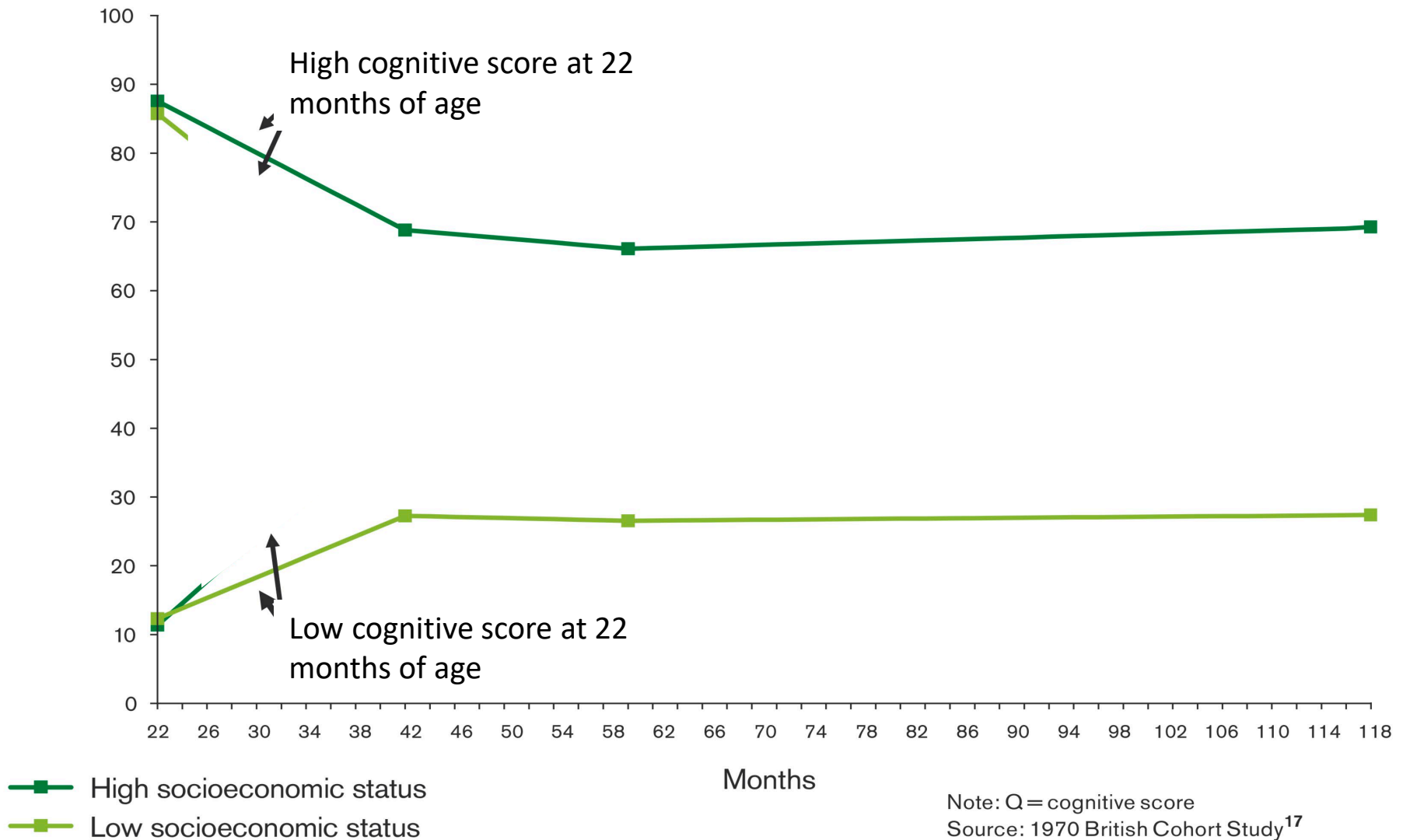
Fair Society, Healthy Lives

Average position
in distribution



Fair Society, Healthy Lives

Average position
in distribution

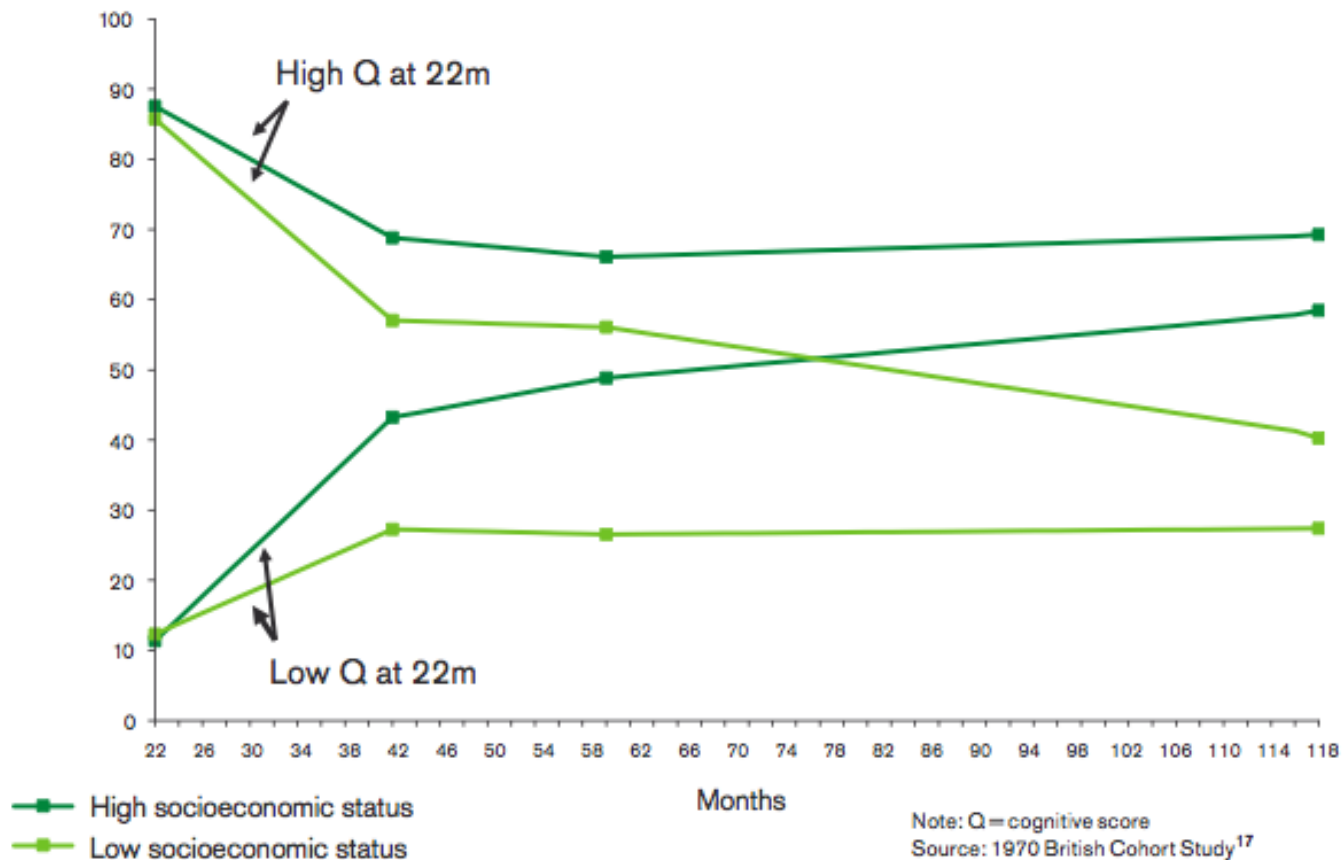


'Fair Society Healthy Lives'

<http://www.instituteofhealthequity.org/resources-reports/fair-society-healthy-lives-the-marmot-review/fair-society-healthy-lives-full-report-pdf.pdf>

Figure 6 Inequality in early cognitive development of children in the 1970 British Cohort Study, at ages 22 months to 10 years

Average position
in distribution



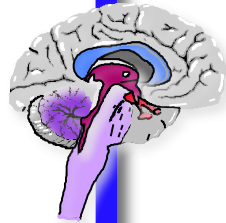
Early brain development and pruning



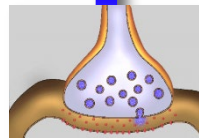
Biological Embedding



Experience/Behavior



Neural Circuitry



Cell/Synapse



Gene Expression



Gene-environment interactions

Social epigenetics is the process by which **early life experience** influence chemical reactions that, in turn, alter the ways our genes function or are expressed.

And these differences in expression influence lifelong health and wellbeing.





Wet Season



Dry Season

Precis octavia



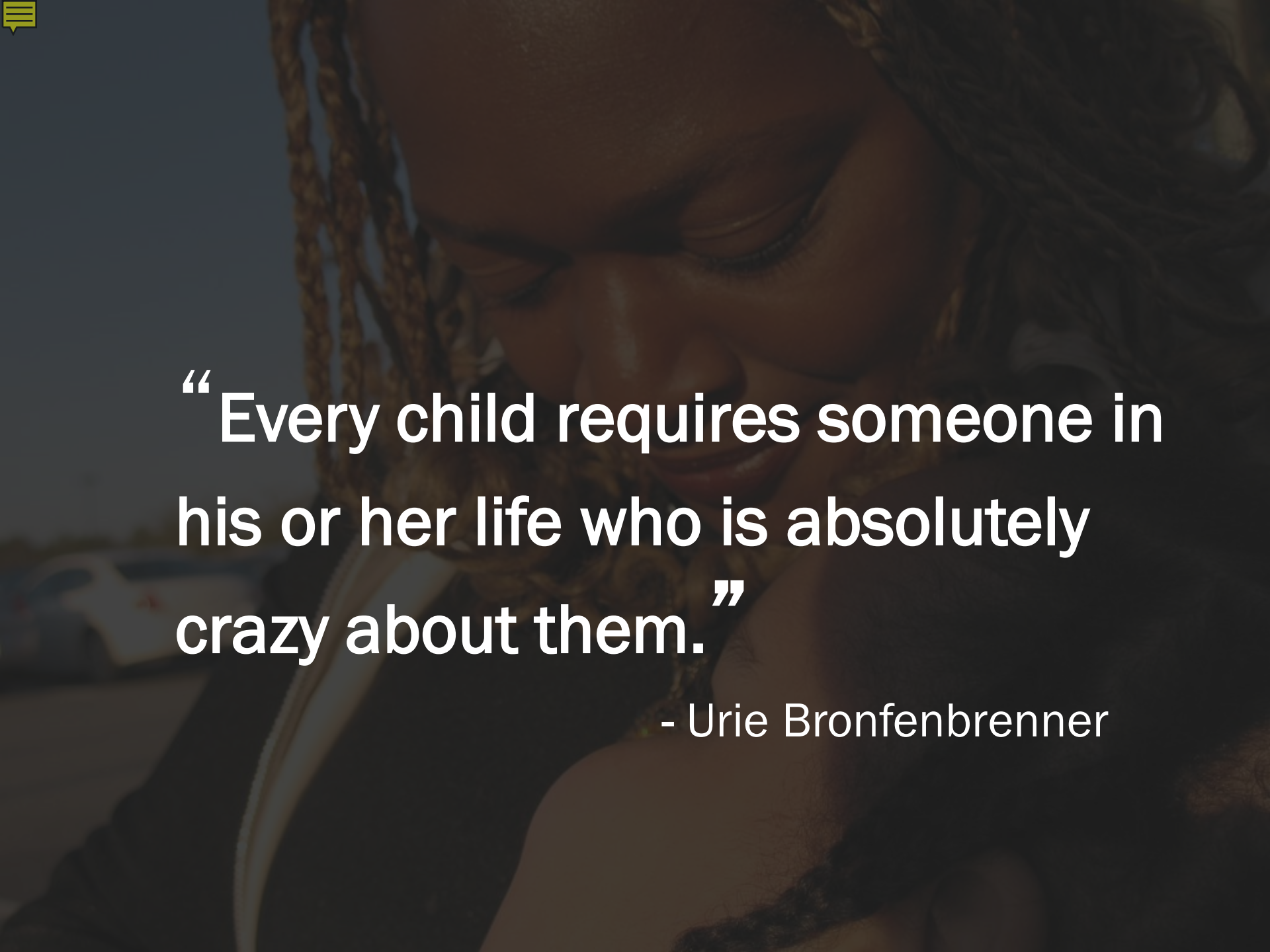
Early experiences





“The making and breaking of affectional bonds”

John Bowlby, 1977



“Every child requires someone in his or her life who is absolutely crazy about them.”

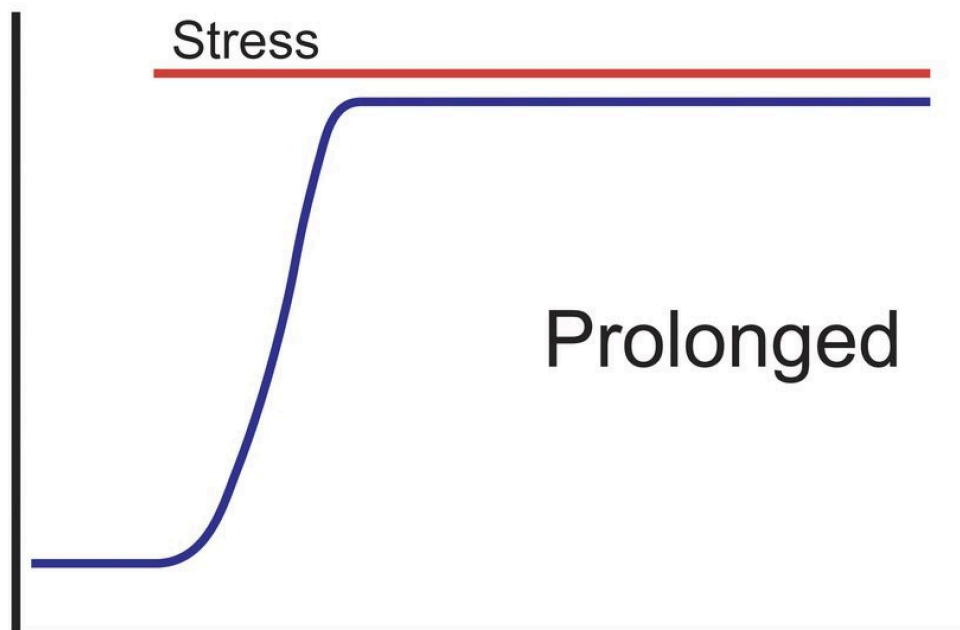
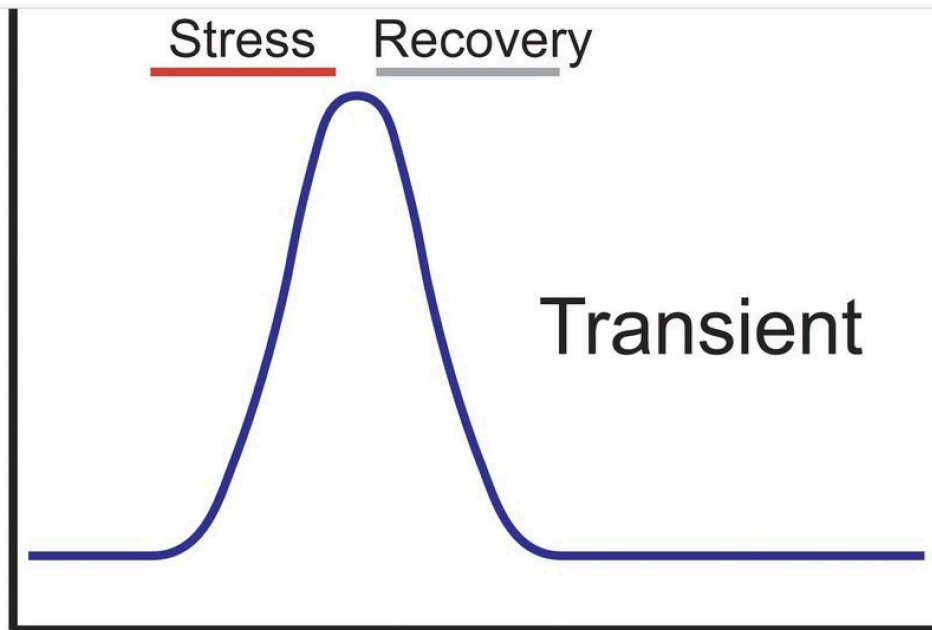
- Urie Bronfenbrenner



“Owen & Mzee:
The true story of a remarkable friendship”

Caring relationships

... help to regulate stress;





“An Elephant Crackup”

Charles Siebert, New York Times, October 8, 2006



“Love at Goon Park:

Harry Harlow and the science of affection”

Deborah Blum, 2002



Parenting and stress reactivity

- Suomi: Risk, Resilience, and Gene-Environment Interplay in Primates
- Meaney, M. J. (2001). Maternal care, gene expression, and the transmission of individual differences in stress reactivity across generations. *Annual review of neuroscience*, 24(1), 1161-1192.
- Boyce, Ellis: Biological sensitivity to context: I. An evolutionary-developmental theory of the origins and functions of stress reactivity.
- <https://www.theatlantic.com/magazine/archive/2009/12/the-science-of-success/307761>

Caring relationships

... help to regulate stress;

... and less toxic stress means healthy gene expression and better brain development.

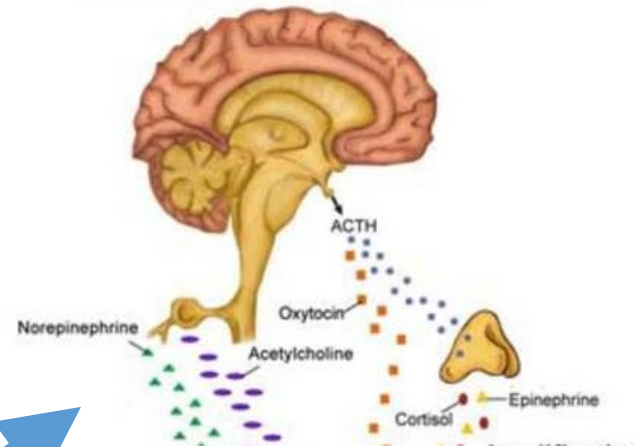


Chronic childhood adversity

Miller, Chen, & Parker, 2011

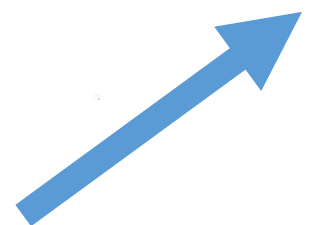


Altered hormonal milieu

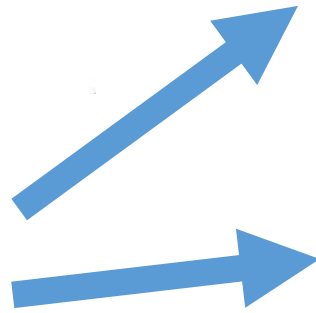


**Heightened
stress
reactivity**

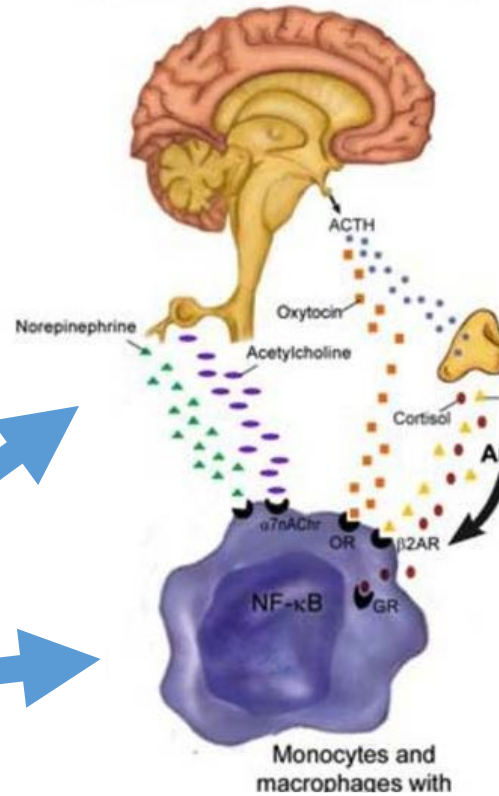
Chronic
childhood
adversity



Chronic
childhood
adversity



Altered hormonal milieu

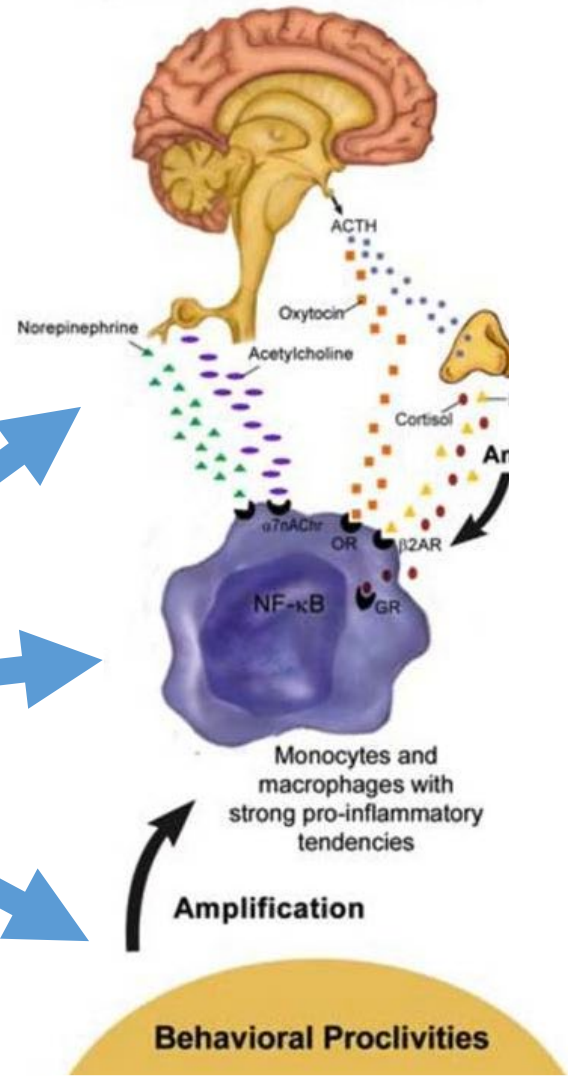


Heightened
stress
reactivity

Heightened
inflammatory
tendencies



Altered hormonal milieu

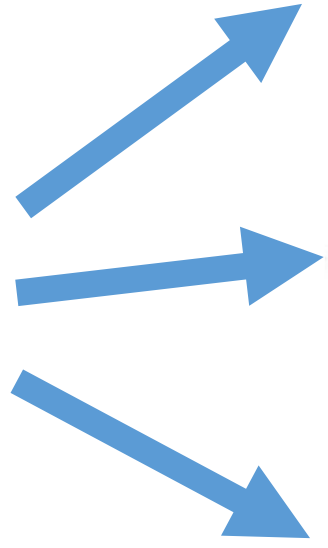


Heightened stress reactivity

Heightened inflammatory tendencies

Antisocial behavioral proclivities

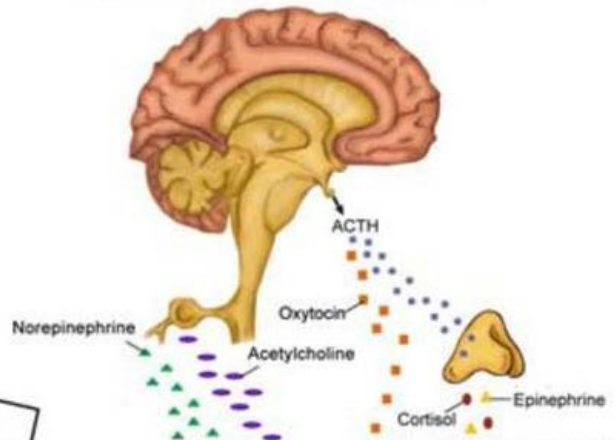
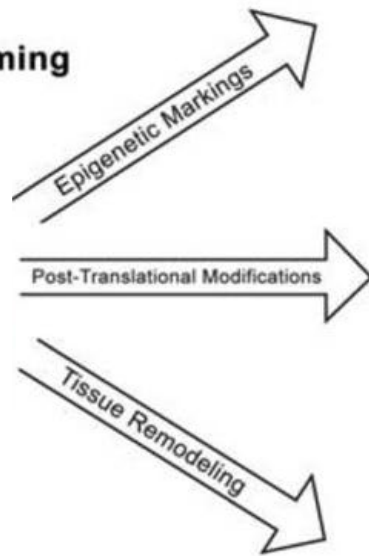
Chronic childhood adversity



Chronic childhood adversity

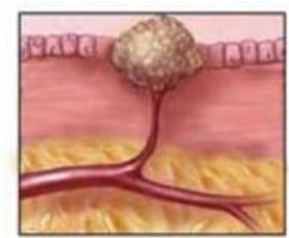
Altered hormonal milieu

Programming



Amplification

Amplification



Behavioral Proclivities

Tuning of corticolimbic circuits results in vigilance, mistrust, and poor social ties

Tuning of corticostriatal circuits leads to impulsivity, future discounting, unhealthy lifestyle

Miller, Chen, & Parker, 2011



Lack of caring relationships

Children lacking warm, caring relationships are more likely to ...

be aggressive;

report lower wellbeing;

develop brains that are not as effective in regulating negative feelings and emotions;

show poorly regulated responses to stress;

have poor immune functioning;

have cognitive impairment.



Nutrition



Dolinoy, Weidman, & Jirtle, 2007



Identical genes, but different prenatal diet



Restricted diet:
More obesity
More diabetes
More cancers

Waterland & Jirtle, 2003

Nutrition

In humans,

mothers' nutrition during pregnancy


is associated

with risk for obesity, diabetes, cancers,

and other health outcomes in their infants.



Sleep



Silva et al., 2004



Sleep



Sleep loss or deprivation

Obesity & Diabetes

Hypertension and cardiovascular disease

Anxiety & Depression

Cognitive functioning

Smaldoen et al., 2007

Sadeh et al., 2002



Importance of Play



Play

Fagen & Fagen,
2004

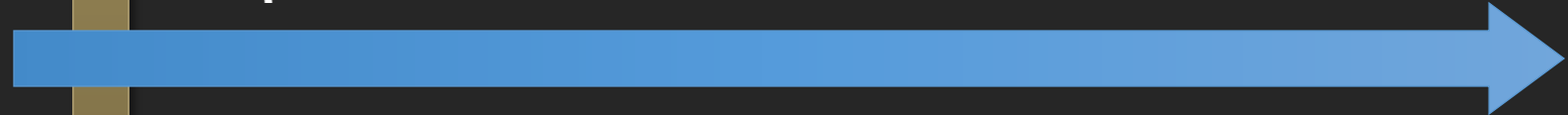




Play & brain size across species

Lewis, 2003

Social play



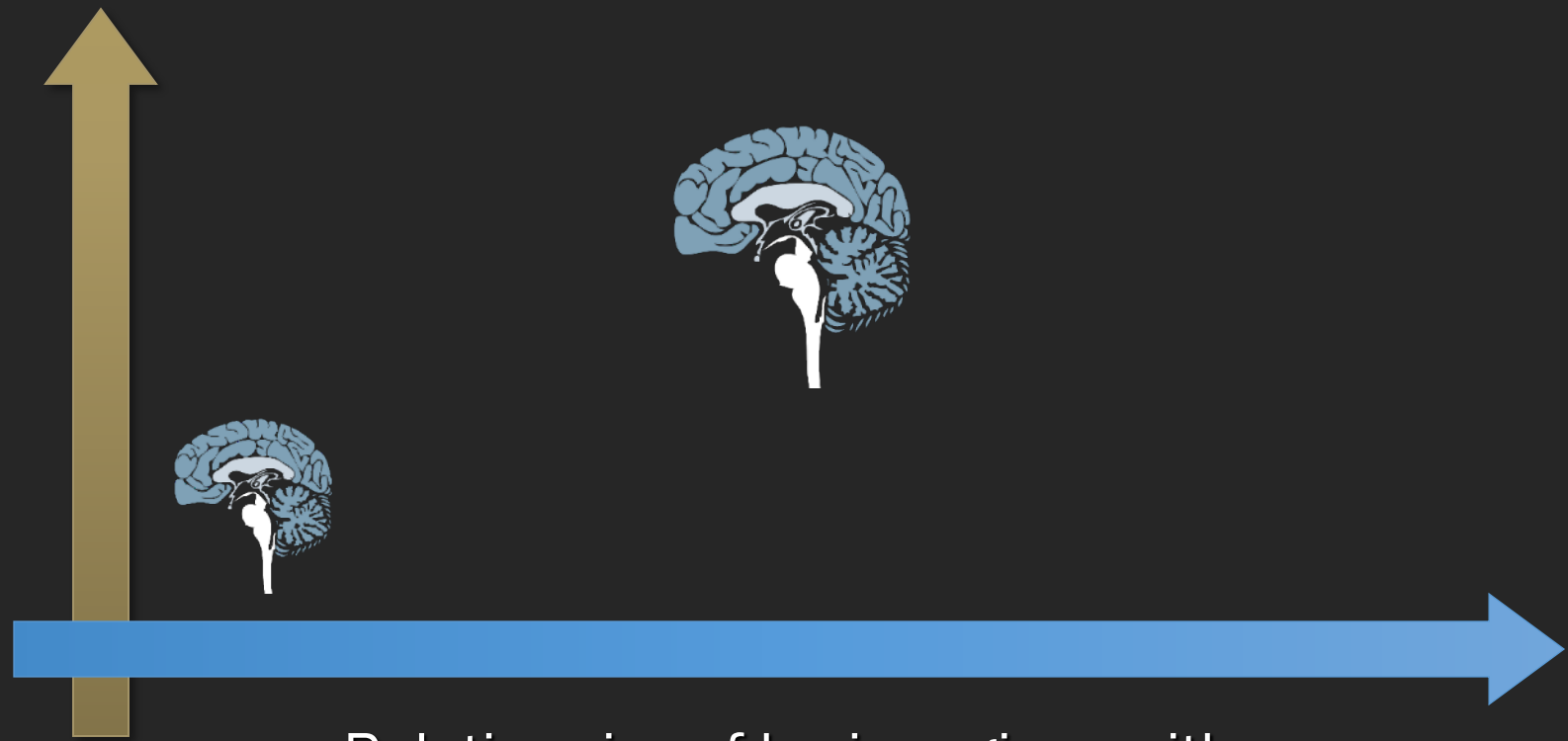
Relative size of brain regions with
socio-cognitive, motor, emotional, & visual functions



Play & brain size across species

Lewis, 2003

Social play



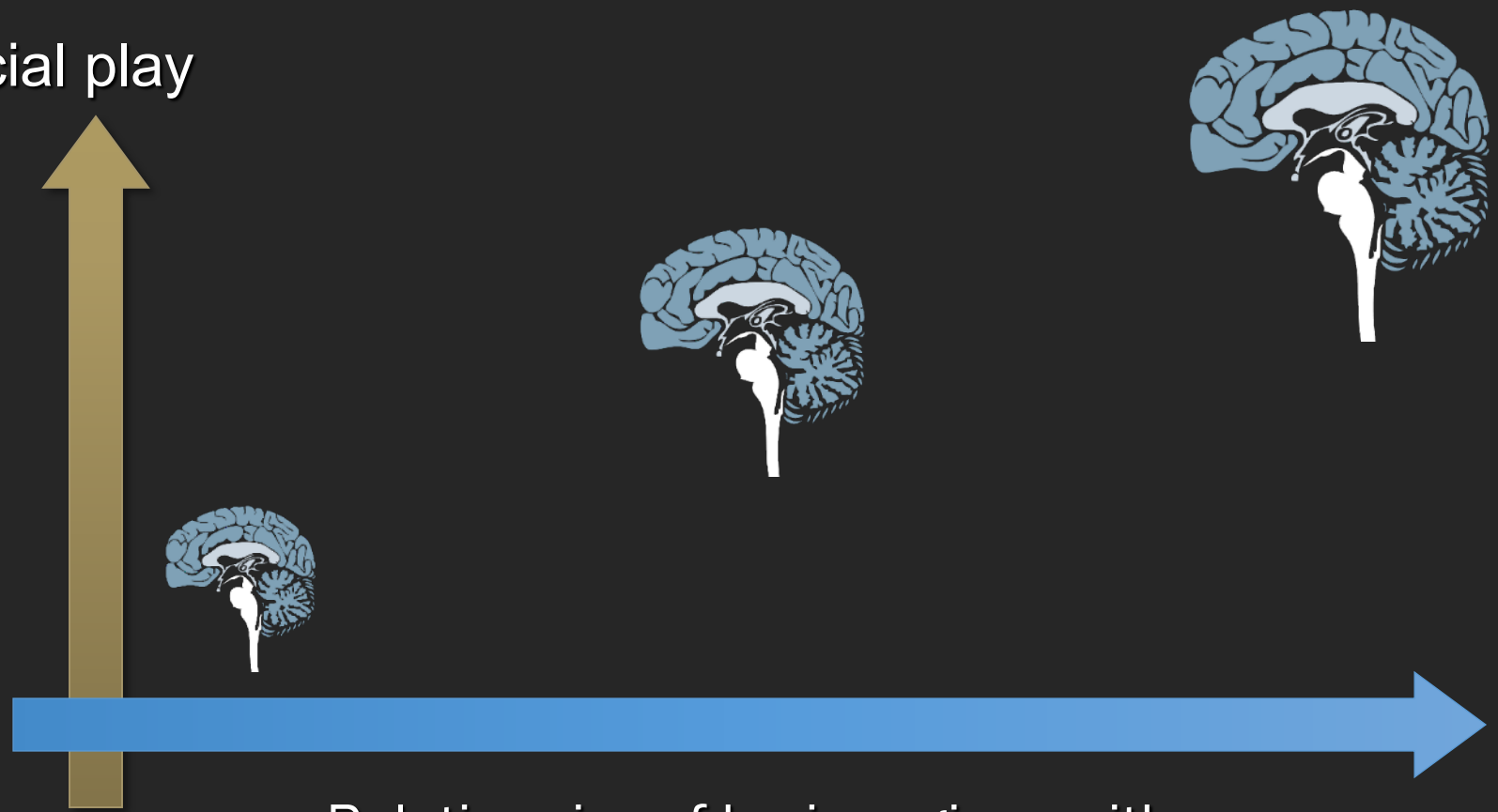
Relative size of brain regions with
socio-cognitive, motor, emotional, & visual functions

Lewis, 2003



Play & brain size across species

Social play



Relative size of brain regions with
socio-cognitive, motor, emotional, & visual functions

Play & human development

“Social pretend play and developmental theory-based programs that integrate different forms of play have positive long-term associations with social, emotional, and cognitive skills, and behavioral outcomes.”

- Lillard, Pinkham, & Smith, 2011;
- Konner, 2010

Interim summary ...



LE PENSEUR

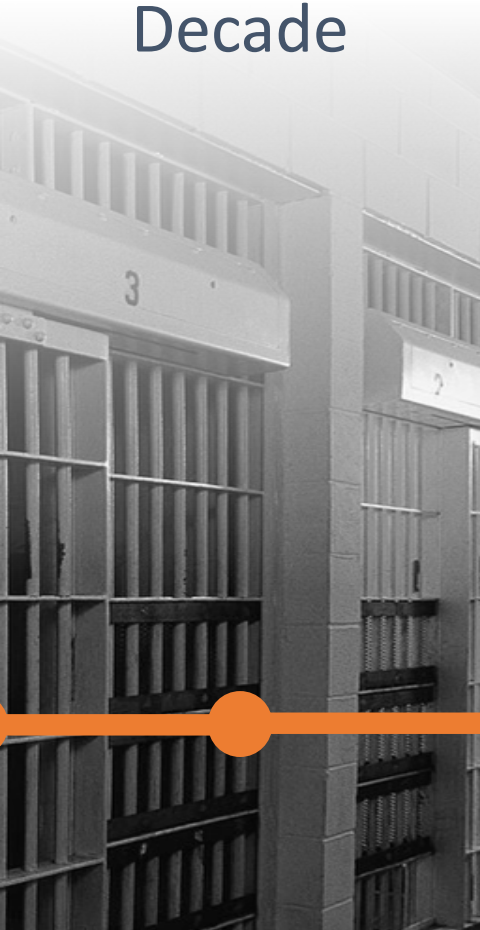
Biological embedding

“How Experience Gets Under the Skin to Create Gradients in Developmental Health”

- Annual Review of Public Health
- Hertzman & Boyce
- http://www.annualreviews.org/doi/full/10.1146/annurev.publhealth.012809.103538?url_ver=Z39.88-2003&rfr_id=ori%3Arid%3Acrossref.org&rfr_dat=cr_pub%3Dpubmed



2nd
Decade



School failure

3rd/4th
Decade



Obesity
Depression

5th/6th
Decade



Coronary heart
disease
Diabetes

Old
Age



Premature aging
Memory loss

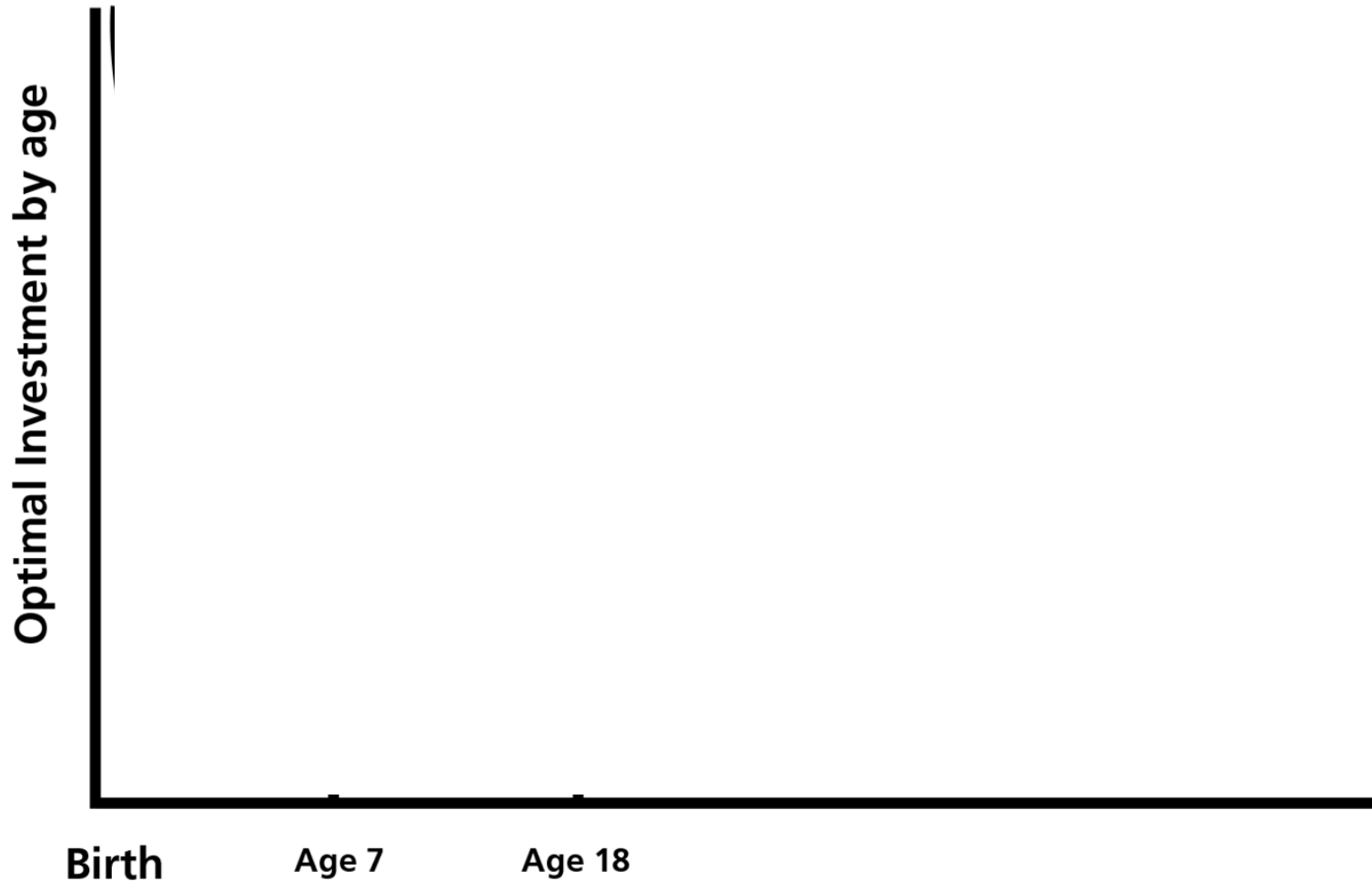
*If you had a billion CAD\$
to spend on a 'public
health issue', ...
what would you do?*



LE PENSEUR

The Heckman Equation

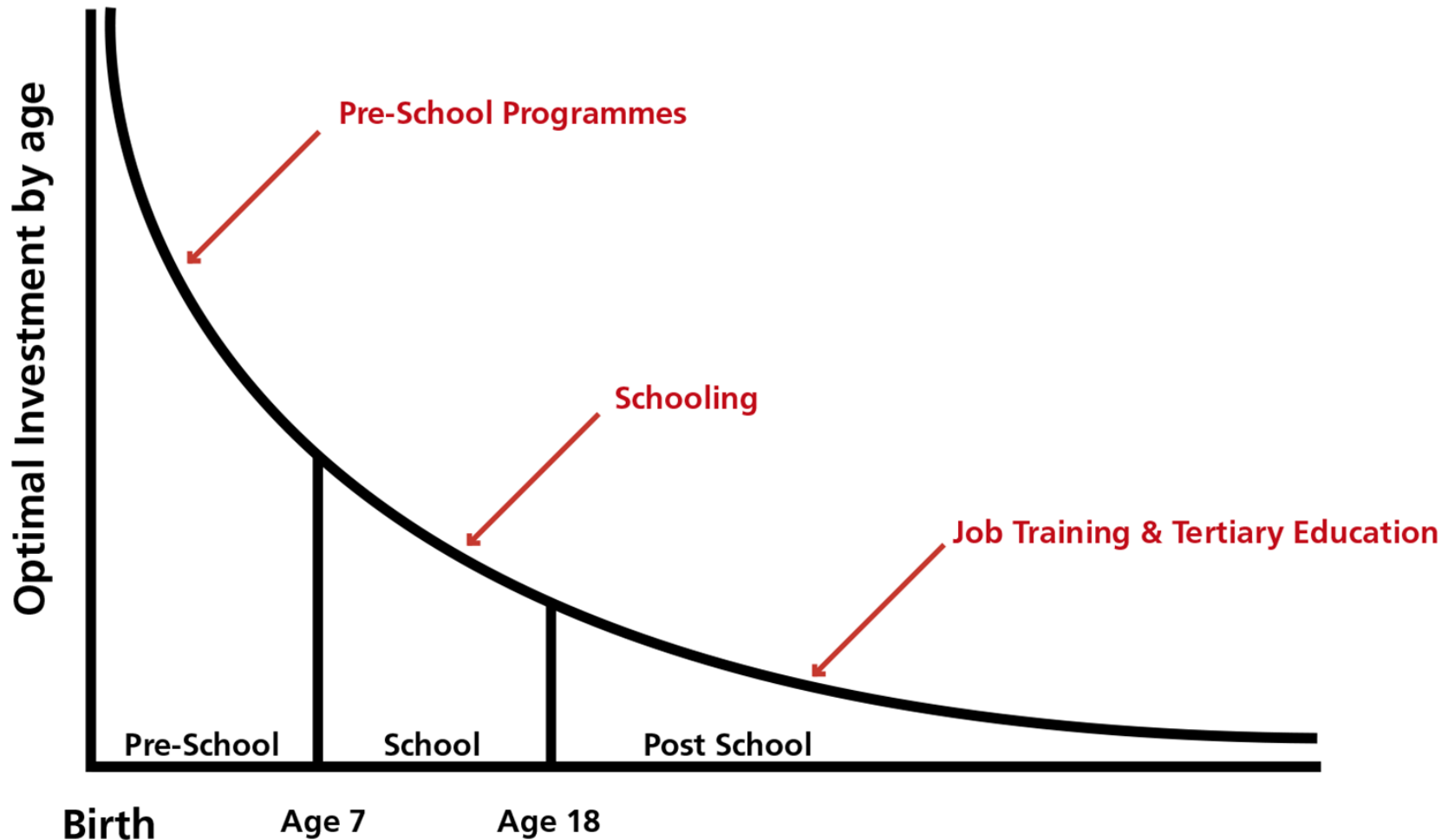
Optimal Investment Levels



Source: Heckman & Carneiro (2003) Human Capital Policy

The Heckman Equation

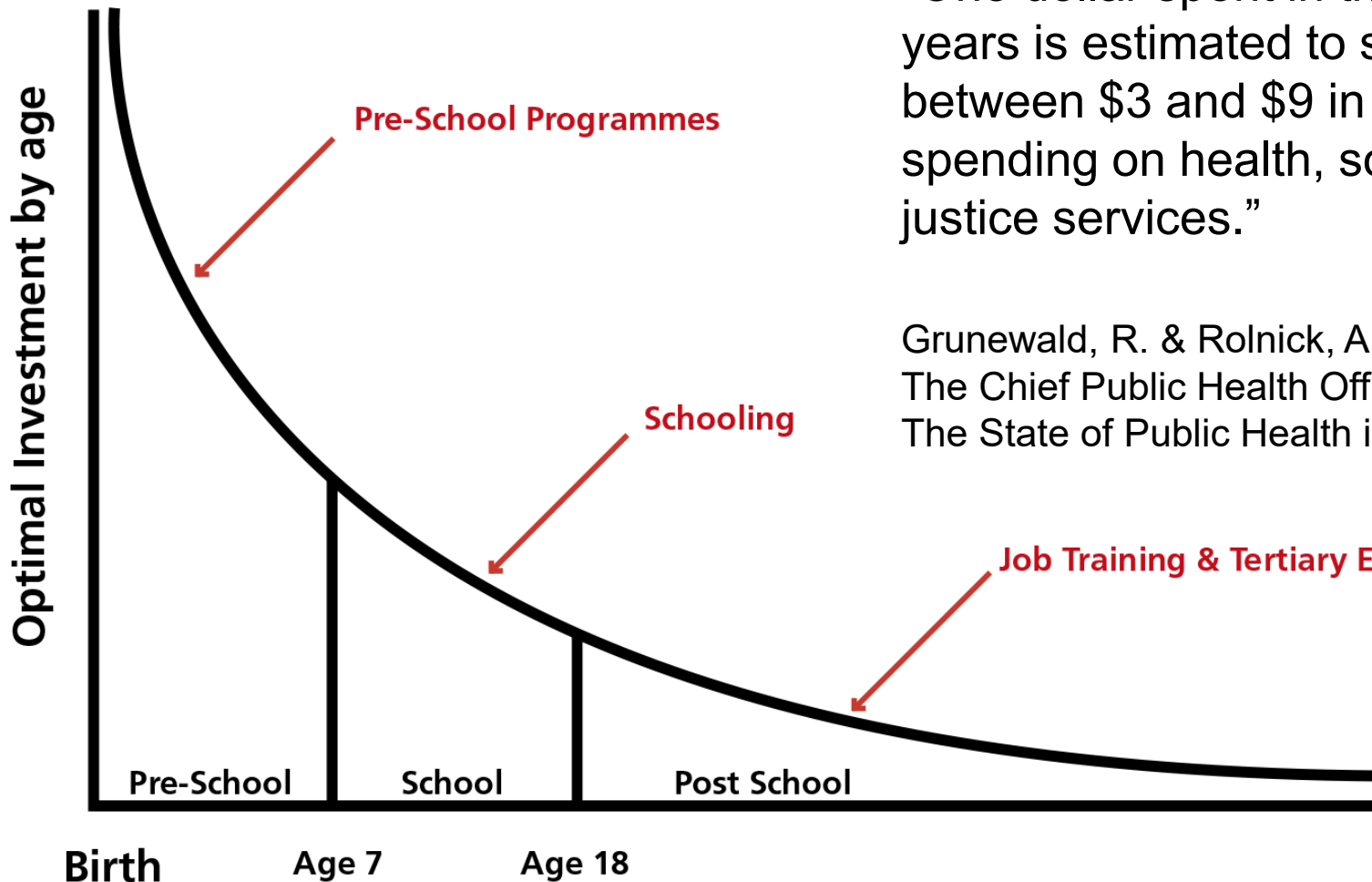
Optimal Investment Levels



Source: Heckman & Carneiro (2003) Human Capital Policy

The Heckman Equation

Optimal Investment Levels



“One dollar spent in the early years is estimated to save between \$3 and \$9 in future spending on health, social and justice services.”

Grunewald, R. & Rolnick, A. (2006), from The Chief Public Health Officer’s Report on The State of Public Health in Canada 2009



What are
children's
early childhood
experiences
in BC?

Pilot findings 2016-2018



TDI

Toddler Development
Instrument

12 to 24 months



CHEQ

Childhood Experiences
Questionnaire

Start of Kindergarten

HUMAN
EARLY LEARNING
PARTNERSHIP



Thank you!

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